

ETV Pilot for Indoor Air Products

Electronic Air Cleaners Stakeholder Meeting Meeting Summary

**December 15, 1998
Arlington, VA**

Background

The Research Triangle Institute (RTI) is working with the U.S. Environmental Protection Agency (EPA) to develop an environmental technology verification (ETV) program for indoor air products. Specific product sectors have been selected for the program with cooperation from stakeholder groups composed of industry, customers, government and other organizations. These groups advise RTI and EPA during the development and validation of a test protocol. The test protocols are then available for use by private testing programs. The first meeting of the stakeholder group for electronic air cleaners was held in Silver Spring, MD on December 15, 1998. The agenda is [Attachment 1](#).

Action Items

The following action items were assigned to be completed before or at the next meeting.

1. RTI will write and distribute draft minutes to all attendees. The attendees will review the minutes and report to RTI any changes or additions they feel necessary. RTI will incorporate comments and then distribute the minutes to all stakeholders. A summary of the minutes will be posted on the RTI and EPA ETV web sites.
2. RTI and EPA will convene a conference call in early January to discuss issues related to dust loading, end of test decision and incorporating cleaning into the test. Honeywell and Trion had indicated that they will take part. Others interested in the discussion should contact Debbie Franke (919) 541-6826.
3. RTI will send out the minutes of the dust conference call.
4. RTI will develop a draft protocol/test plan based on ASHRAE 52.2 and results of the dust conference call.
5. RTI will address quality issues necessary for the protocol and the verification tests.
6. EPA and RTI will look at existing data and run tests (as necessary) on electrostatic precipitators to determine if repeated cleaning has an effect on the minimum efficiency of the device.

7. EPA and RTI will collect existing ozone standards, and report on the test methods, standard levels, etc.
8. RTI will organize a second meeting to be held at RTI in the May-June, 1999 time frame.

Introductions

The meeting was convened at 8:30 am by Dave Ensor. All participants introduced themselves and discussed their interest in electronic air cleaners. Attachment 2 gives the list of attendees.

Environmental Technology Verification

Penny Hansen, director of EPA's Environmental Technology Verification program and Les Sparks, EPA program officer for the ETV indoor air program, discussed the ETV program. ETV was initially funded at \$10 million a year. This amount will gradually decline as vendors provide more of the funding for testing. The indoor air pilot has thus far been funded at \$1.5 million. Thus far 25 technologies have been tested and reported, with 53 technologies currently in testing. While there is a 5-year pilot program ending in 2000, it is expected that the program will continue with new technologies continually being tested. However, it is not clear whether EPA will continue to have a role in all twelve pilot programs. The indoor air program now has three stakeholder groups and has the largest number of stakeholders (176 separate individuals, although some people are members of more than one stakeholder group).

Questions were asked about testing new technologies. If a new indoor air technology would be interested in ETV testing and there were no formal stakeholder group established in that area, the company should contact RTI as the verification partner. They could also contact Les Sparks and the ETV office for help. With the current programs, individual products are not being verified, rather test protocols are developed and verified. While this policy could change in the future, companies should be aware of the current practice. The air cleaner stakeholder group is an example of a need for a test protocol and the Indoor Air ETV program evolving to meet that need.

Indoor Air Program

Dave Ensor provided an update to RTI's program. Both the commercial furniture and the general ventilation air filter programs are currently testing. Stakeholder meetings in the next two months will review the test results and the final test protocols.

Air Conditioning and Refrigeration Institute (ARI) Testing Program

Steve Sanders and Brian Boender presented an update on planning for the ARI testing program. This included background on ARI and their existing certification programs. They also presented technical issues for an electronic air cleaner testing program.

Stakeholder Process

Debbie Franke presented information on the logistics of the Electronic Air Cleaner Stakeholder Group. Following this meeting, RTI will develop a test protocol and distribute it for review. There will be a second stakeholder meeting to discuss the protocol and plans for testing. The testing will be used to validate the test protocol. Results of the testing will be issued as a protocol verification report and will include no product identification information.

Electronic Air Cleaner Testing Protocol

Jim Hanley discussed past work RTI has done in testing electronic air cleaners. He discussed potential problems with using ASHRAE 52.2 test method for electrostatic precipitators: the high quantity of carbon in the dust and the use of pressure drop to determine test endpoint. Four types of products were discussed as a basis for defining the product to be tested:

- Electrostatic precipitators can be either two stage (ionizing and collecting) or one stage.
- Actively-charged media filters with either two stages with media in between or one stage.
- Electret filters have electrically charged media but do not use an active current.
- Ionizers are not actually filters but are rather used to enhance the movement of particles.

The group discussed including the first two types of filters, but not the last two, as there are other test methods for these.

Types of dusts were discussed and include:

- ASHRAE dust - Arizona road dust, linters, carbon black,
- ASHRAE dust without carbon
- ASHRAE dust with reduced carbon
- Develop a new dust or a new "non" dust

The carbon is of concern for the electronic air cleaners because of its conductive nature. The discussion of the dust will continue on a conference call.

Among the measures that could be used to determine end point are:

- Pressure drop (currently used in ASHRAE 52.2)
- Current drain
- Voltage drop
- "Snaps" per minute
- Fixed amount of dust
- Electronic failure

Industry members indicated that they have tested using fixed amounts of dust. The discussion of the dust will continue on a conference call.

Performance parameters which could be measured include:

- Filter efficiency
- Dust holding capacity
- Recovery of filtration efficiency after multiple washings or cycles
- Ozone generation
- Power consumption
- Collection plate area

The group discussed filter efficiency as the primary measure, and that it could be reported as a initial, minimum or average efficiency over some defined "life".

General Discussion

Dave Ensor lead the group in a discussion of the testing issues.

There are concerns about whether the ASHRAE dust, with heavy carbon content, is appropriate for ESPs. The ASHRAE 52.2 method includes a conditioning step plus four dust loading steps and ends when the pressure drop is .5 inch. Since there is no corresponding pressure drop for ESPs, then there needs to be another way to determine "end of test". Using a specific amount of dust, such as 100 grams was discussed. There was also a discussion of cleaning (washing) the ESP as part of the test cycle, since that occurs in real use. Air flow velocity was discussed briefly, with industry favoring 492 CFM. These issues were not resolved at the meeting, but rather will be discussed further in a conference call with RTI, EPA and others interested. Honeywell and Trion indicated that they wanted to take part. In addition, EPA and RTI will look at old data and perform tests as necessary to determine if cleaning does affect the minimum efficiency of the filter.

In a discussion of the product definition, there was general agreement that for this program, an electronic air cleaner must a) have a cord (active electrical current), b) be intended for residential or light commercial use (up to 2000 CFM) and c) ducted.

Pauline Johnston from EPA and Leyla McCurdy from American Lung Association want to make sure that ozone generation is addressed. There are several existing standards for ozone that electronic air cleaners already must meet. The Food and Drug Administration (FDA) has set a maximum limit of 0.05 ppm for indoor medical devices (21CFR801.415). The Occupational Safety and Health Administration (OSHA) exposure limit is no more than an average concentration of 0.10 ppm for 8 hours (29 CFR 1910 Subpart Z). RTI and EPA will look at the existing standards and the test methods used for them.

Power consumption was also mentioned. This is included in product specifications and it was not felt that additional tests were necessary.

No date was set for the next meeting, although May or June 1999 times were discussed. The draft protocol will be distributed before the meeting and will be discussed then. The meeting will probably be held at RTI and an announcement will be distributed once the meeting date is set.

List of Attendees, December 15, 1998

Brian Boender, Trion, Inc.
Tom Bruursema, NSF International
Jim Clark, Feudenberg
Dave Ensor, RTI
Debbie Franke, RTI
Jim Hanley, RTI
Penny Hansen, EPA
Charles Haynes, Trion, Inc.
Scott Hines, ICF Kaiser
Pauline Johnston, EPA
Joesph Koman, Federal Trade Commission
Casey Kurylowicz, Farr Company
Leyla McCurdy, American Lung Association
Jim Mullen, Lennox Industries, Inc.
Tom Phillips, California Air Resources Board
John Reyna, EPA
Chuck Rose, AAF International
John Sabelli, Intertek Testing Services
Steve Sanders, ARI
Les Sparks, EPA

Brad Terlson, Honeywell Inc.
Al Veeck, Tidewater Air Filter, Inc